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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/714,090
Filing Date: November 14, 2003
Appellant(s): NICKLAS, PETER J.

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For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/18/08 appealing from the Office action mailed 9/11/07.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) **Evidence Relied Upon**

5,861,605	Ogawa et al.	1-1999
3,855,015	Nemoto et al.	12-1974
3,531,620	Arikawa et al.	9-1970

(9) Grounds of Rejection

Claims 10 & 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al. (USPN 5,861,605) in view of Nemoto et al. (USPN 3,855,015).

Ogawa et al. discloses a flux cored welding wire with a stainless steel sheath. The core contains Al_2O_3, $CaCO_3$, CaF_2, MgO, Na_2O_3 and other compounds and elements. The flux ratio ranges from 23 to 25 wt%. The combined amounts of Al_2O_3 and Na_2O_3 are about 1.5 wt%.

Ogawa et al. does not teach combined amounts of Al_2O_3 and Na_2O_3 of 14 wt%.

Nemoto et al. discloses the submerged arc welding of a steel product. The flux used in welding is a 4:1 weight ratio of (i) SiO_2 (16wt%), Al_2O_3 (16wt%), Ca (21wt%), MnO (31wt%), CaF_2 (7wt%), Fe_2O_3 (4wt%), & Na_2O_3 (3wt%) and (ii) $CaCO_3$ (2wt%), CaF_2 (40wt%), Mn (15wt%), & Fe-Ti (25wt%). Thus in the combined fluxes the total Al_2O_3 and Na_2O_3 is approximately 15.2 wt%.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the Al_2O_3 and Na_2O_3 amounts as taught by Nemoto et al. in the Ogawa et al. system because they are both drawn to submerged arc welding of similar materials.

The exact amounts of each of the constituents as presently claimed are not disclosed in the prior art; however, the prior art compositions closely approximate appellant's claimed invention. It has been held that one of ordinary skill in the art at the time of the invention would have considered the claimed compositions to have been obvious because close approximation in a composition is considered to establish a prima facie case of obviousness. See In re Malagari, 182 USPQ 549, *Titanium Metals v. Banner* 227 USPQ 773, In re Nehrenberg 126 USPQ 383.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al. and Nemoto et al., as stated in the above paragraph and further in view of Arikawa et al. (USPN 3,531,620).

Ogawa et al. does not teach the presence of Fe, FeMg or FeSi.

Arikawa et al. discloses an arc-welding electrode, which has a cylindrical steel casing. The powdered core may contain $MgCO_3$, $CaCO_3$, Al-Mg, Al_2O_3, Na_2O, MgO, ferrous powder, CaF_2, Mg powder, Fe-Si and other compounds and elements. It would have been obvious to one of ordinary skill in the art at the time of the invention to use ferrous powder and Fe-Si, as taught by Arikawa et al. in the Ogawa et al. system because the iron (ferrous) part is a metallic component of the welded joint and the Si compounds are known deoxidizers which mitigate detrimental oxidation effects in the welded joint.

(10) Response to Argument

Claims 10 & 12 rejected under 35 USC 103(a) over Ogawa et al. in view of Nemoto et al.

Appellant argues that there is no motivation to combine the references.

In response to appellant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Ogawa et al. is directed to a flux cored welding wire for arc welding and Nemoto et al. is directed to the flux used for submerged arc welding. The references are combined with respect to flux.

Appellant argues that Ogawa et al. does not disclose the text submerged, as in submerged arc welding. The examiner respectfully notes that Ogawa et al. is directed to arc welding as evidenced by the following:

> The present invention relates to a high nitrogen flux cored **welding wire** to be used for welding of a Cr--Ni type stainless steel, which has superior pitting corrosion resistance, crevice corrosion resistance and so forth and can provide enhanced workability in welding, such as **arc stability**, slag removing characteristics and so forth. (col. 1, lines 6-11)

The examiner believes that a definition would be helpful. As defined by the American Society for Metals handbook (ASM): *submerged arc welding is arc welding in which the arc, between a bare metal electrode and the work,*

is shielded by a blanket of granular fusible material overlaying the joint. Thus submerged arc welding is merely a subset of arc welding and hence Ogawa et al. inherently encompasses submerged arc welding, even if it is not specifically stated in the reference. Furthermore, instant claims are directed to a welding wire, of which the intended use is submerged arc welding. Lastly, Nemoto et al. the secondary reference is directed to submerged arc welding.

Appellant argues that the examiner correctly pointed out that Ogawa et al. does not teach combined flux amounts of Al_2O_3 and Na_2O_3 of 14 wt%. The examiner respectfully notes that instant claims are not only directed to Al_2O_3 and Na_2O_3 of 14 wt%. Ogawa et al. discloses a flux cored welding wire with a stainless steel sheath. The core contains Al_2O_3, $CaCO_3$, CaF_2, MgO, Na_2O_3 and other compounds and elements. The flux ratio ranges from 23 to 25 wt%. The combined amounts of **Al_2O_3 and Na_2O_3 are about 1.5 wt%**. Thus Ogawa et al. meets all of the instant claim limitations except for the limitation that the combined amount of Al_2O_3 and Na_2O_3 is 14 wt%. This is met by Nemoto et al. Nemoto et al. discloses the submerged arc welding of a steel product. The flux used in welding is a 4:1 weight ratio of (i) SiO_2 (16wt%), **Al_2O_3** (16wt%), Ca (21wt%), MnO (31wt%), CaF_2 (7wt%), Fe_2O_3 (4wt%), & **Na_2O_3** (3wt%) and (ii) $CaCO_3$ (2wt%), CaF_2 (40wt%), Mn (15wt%), & Fe-Ti (25wt%). Thus, Nemoto et al. teaches the flux total of Al_2O_3 and Na_2O_3 is approximately 15.2 wt%. It is the position of the examiner that total amount of Al_2O_3 and Na_2O_3 flux ranges from 1.5 wt% to 15.2 wt% as taught by the combination of references; that is, Ogawa et al. and Nemoto et al., which encompasses the 14 wt% of instant claims. In response to appellant's arguments

against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellant proceeds to argue that the obvious statement of the examiner: "it would have been obvious to one of ordinary skill in the art at the time of the invention to use the Al_2O_3 and Na_2O_3 amounts as taught by Nemoto et al. in the Ogawa et al. system because they are both drawn to submerged arc welding of similar materials" is completely wrong. The examiner respectfully disagrees because Ogawa et al. is directed to arc welding and Nemoto et al. is directed to submerged arc welding, which is a subset of arc welding.

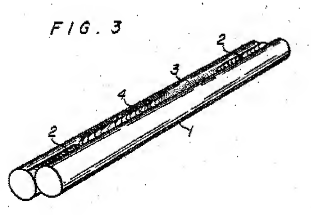
Appellant argues that the composition of flux of Nemoto cited by the examiner has nothing to do with the weld wire of instant claim 10. The examiner respectfully disagrees because the welding flux of Nemoto et al., which is the *blanket of granular fusible material overlaying the joint*, as defined by ASM meets the flux of instant claims, that is: flux total of Al_2O_3 and Na_2O_3 is approximately 15.2 wt% (while instant claims require 14 wt%). It is the position of the examiner that the references are drawn to arc welding and welding fluxes; Ogawa et al. discloses an internal flux (inside the welding wire) of Al_2O_3 + Na_2O_3= 1.5wt% and Nemoto et al. discloses an external welding flux of Al_2O_3 + Na_2O_3= 15.2wt%. These ranges encompass appellant's 14 wt% of instant claims.

Appellant argues that these are separate welding fluxes and that they are irrelevant and have nothing to do with the core of the welding wire. The examiner respectfully disagrees because Ogawa et al. teaches an arc welding wire with an internal flux composition of Al_2O_3 + Na_2O_3= 1.5wt%, while Nemoto et al. discloses submerged arc welding with a bare wire and a flux (*blanket of granular fusible material overlaying the joint)* of Al_2O_3 + Na_2O_3= 15.2wt%. It is the position of the examiner that both references are drawn to arc welding which require the use of flux, albeit that one is an internal flux and the other an external flux. The fluxes, both internal and external are required to negate welding defects such as porosity effects or blow holes in the final weld joint. Ogawa et al. already teaches that it is known to use Al_2O_3 and Na_2O_3 in the flux composition of the welding wire. The only missing component is the higher compositional amount. Nemoto et al. discloses that it is known to use Al_2O_3 and Na_2O_3 (15.2wt%), albeit an external flux, it is still a flux. Both references are drawn to arc welding and hence in the same field of endeavor, thus is would have been fairly obvious to one of ordinary skill in the art at the time of the invention to use the larger flux amounts, as taught by Nemoto et al. external flux in the Ogawa et la. internal flux of the welding wire.

Appellant argues that Nemoto et al. discloses two fluxes which can be used as a separate flux sprinkled on two metal portions which can be later welding using solid wire in a SAW process and that Ogawa et al. describes an unrelated flux core welding electrode. The examiner respectfully disagrees because Ogawa et al. discloses a flux cored welding wire which closely approximates Appellant's instant claims, differing only

in the amount of Al_2O_3 and Na_2O_3 present. Ogawa et al. discloses an Al_2O_3 and Na_2O_3 flux amount of about 1.5 wt%. Nemoto et al. discloses the following:

Two bar materials, which were individually 32 mm.in diameter and 300 mm. in length, were so arranged as shown in FIG. 3, and were combined with each other by welding the two at portions distanced by 50 mm. from both ends. Subsequently, a **flux** and powders of alloying elements were **sprinkled over the uncombined portions and melted by** application of high frequency, and the bar materials were welded with each other according to **submerged arc welding** using a wire which had been processed in diameter to 4 mm…. (col. 6, lines 55-64)



In FIG. 3, 2 represents restriction beads welded to both ends of the material 1 to be welded; **3 represents the sprinkled flux** and alloying element powders; and 4 represents the welded beads. (col. 7, lines 24-27).

The formation of the weld metal on the surface of the body was carried out in such a manner that according to submerged arc welding a wire of 4 mm. in diameter, which was composed of 0.59 wt% of C, 0.18 wt% of Si, 0.30 wt% of Mn, 0.008 wt% of P, 0.021 wt% of S, 5.33 wt% of Cr, 1.48 wt% of Mo, 1.10 wt% of V, 0.21 wt% of Ti and the balance of Fe, was spirally welded around the body, while rotating the body, under the conditions of a welding current of 600 A, an arc voltage of 30 V and a welding rate of 35 cm/min. As the **flux was used** a 4:1 mixture of a flux composed of 16 wt% of SiO_2, **16 wt% of Al_2O_3**, 21 wt% of CaO, 31 wt% of MnO, 7 wt% of CaF_2, 4 wt% of Fe_2O_3 and **3 wt% of Na_2O_3**, and a flux

composed of 20 wt% of $CaCO_3$, 40 wt% of CaF_2, 15 wt% of Mn and 25 wt% of Fe-Ti.… (col. 11, lines 15-29)

It is the position of the examiner that the flux of Nemoto et al. having **16 wt% of Al_2O_3** and **3 wt% of Na_2O_3** in the flux, albeit an external flux, teaches the higher compositional amounts of Al_2O_3 and Na_2O_3.

Appellant argues that Nemoto et al. Al_2O_3 and Na_2O_3 flux composition total of 15.2 wt% does not closely approximate appellant's 14 wt% because it is well known that a small amount of carbon change in steel (> 2 wt%) will alter the product and form cast iron. The examiner agrees with Appellant on steel chemistry; however this is not flux chemistry. Steel has a very unique property whereby a very small change in carbon chemistry can elicit radical changes in the steel or cast iron product. Appellant is arguing metallurgical chemistry of a specialize metallic alloy, steel and not flux chemistry in which it is well known in the art that there may be fairly wide chemistry ranges which do not yield catastrophic effects. An example of this is evidenced in Ogawa et al.:

…high nitrogen flux cored wire for welding of Cr--Ni type stainless steel, which is formed by **filling a flux into a sheath** of stainless steel, is composed of: …

…and as **inevitable impurity, ZrO_2 being restricted to less than 0.5 wt %**, and **metal carbonate to less than or equal to 1.0 wt % with respect to total weight of the wire, in said flux.** (col. 2, lines 26-39)

ZrO_2 and metal carbonate are impurities which must be present in less than 0.5 wt% and 1.0 wt%, respectively. These weight percents are relative to the entire weight of the

wire, thus, with respect to the flux the amounts would actually be greater than 0.5 and 1.0 wt%. Flux chemistry has a much higher tolerance for weight percent deviations and consequently, a difference between 14 and 15.2 wt% in a flux (difference between instant claims and the prior art) is not substantially significant.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al. and Nemoto et al. and further in view of Arikawa et al.

Appellant argues that Arikawa discloses the arc welding of steel without using shielding gas or the like. The examiner respectfully notes that shielding gas is not a limitation in instant claims. In response to appellant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which appellant relies (i.e., shielding gas) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Appellant argues that Arikawa does not disclose FeMg nor does Arikawa disclose or suggest a core as set forth in claim 10 and which further includes compacted Fe, FeMg and FeSi as specified in instant claim 11. The examiner respectfully notes that Arikawa et al. is only used in the rejection of claim 11 and thus is not applicable to claim 10. The core of claim 10 has been rejected over Ogawa et al. and Nemoto et al. With respect to claim 11, Arikawa et al. discloses an arc welding electrode containing

Fe powder, Fe-Si, Al-Mg and Mg powder. Consequently, Arikawa et al. explicitly teaches Fe and Fe-Si. It is well known in the art that magnesium (Mg) is highly reactive and will not remain in an independent form in the Arikawa et al. flux but rather will combine with a metallic component of the flux. Thus Arikawa et al. implicitly teaches that Mg is present in a compound form, be it Al-Mg or Fe-Mg from the Fe powder which is present in the flux. Hence it is the position of the examiner that Arikawa et al. inherently teaches the presence of Fe-Mg based on the well known volatile (highly reactive) nature of Mg.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

The following ground(s) of rejection are applicable to the appealed claims:

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/M. Alexandra Elve/

M. Alexandra Elve

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